

WHAT IS CLAIMED IS:

1. A circuit for providing electrical current to a bicycle device comprising:
a current supply circuit that supplies DC current from the power supply to the bicycle device along a current path; and
a current limiting circuit that includes an active resistance circuit that limits electrical current flowing through the current supply circuit when voltage applied to the current limiting circuit is above a minimum value.
2. The circuit according to claim 1 further comprising a varying circuit that varies an amount of current limiting provided by the current limiting circuit.
3. The circuit according to claim 3 wherein the varying circuit varies an amount of current limiting provided by the current limiting circuit by a plurality of discrete values.
4. The circuit according to claim 3 wherein the varying circuit comprises:
a first resistance applied to the current limiting circuit;
a second resistance applied to the current limiting circuit and coupled in series with the first resistance; and
a switch that selectively bypasses the first resistance so that only the second resistance is applied to the current limiting circuit.
5. The circuit according to claim 4 wherein the switch comprises a transistor coupled to a node between the first resistance and the second resistance.
6. The circuit according to claim 3 wherein the varying circuit comprises:
a first resistance applied to the current limiting circuit;
a second resistance applied to the current limiting circuit and coupled in parallel with the first resistance; and
a switch that selectively bypasses the first resistance so that only the second resistance is applied to the current limiting circuit.

7. The circuit according to claim 6 wherein the switch comprises a transistor coupled to a node between the first resistance and the second resistance.

8. The circuit according to claim 2 wherein the varying circuit varies an amount of current limiting provided by the current limiting circuit in a continuous manner.

9. The circuit according to claim 1 further comprising an on/off control circuit coupled to the current supply circuit for selectively switching the current supply circuit on and off.

10. The circuit according to claim 1 wherein at least one of the current supply circuit and the current limiting circuit comprises a field effect transistor with a resistance coupled between a gate terminal and a source terminal thereof.

11. The circuit according to claim 10 wherein the resistance comprises a variable resistance.

12. The circuit according to claim 1 further comprising an LED coupled for receiving the current from the current supply circuit.

13. The circuit according to claim 1 further comprising a light bulb that includes a filament coupled for receiving the current from the current supply circuit.

14. The circuit according to claim 1 further comprising a backlight for a liquid crystal display device that is structured to be mounted to the bicycle, wherein the backlight is coupled for receiving the current from the current supply circuit.

15. The circuit according to claim 1 further comprising a headlight structured to be mounted to the bicycle, wherein the headlight is coupled for receiving the current from the current supply circuit.

16. The circuit according to claim 1 further comprising a tail light structured to be mounted to the bicycle, wherein the tail light is coupled for receiving the current from the current supply circuit.

17. The circuit according to claim 1 wherein the current supply circuit and the current limiting circuit are structured to receive a DC signal obtained by rectifying an AC signal derived from a dynamo.

18. The circuit according to claim 1 wherein the current supply circuit comprises a first transistor structured to receive current from the power supply and provide current to the bicycle device.

19. The circuit according to claim 18 wherein the current limiting circuit comprises a second transistor coupled to the first transistor to control a current flowing through the first transistor.

20. The circuit according to claim 19 wherein the first transistor comprises a first bipolar transistor, and wherein the second transistor comprises a second bipolar transistor.

21. The circuit according to claim 20 wherein a voltage arising from a base-emitter voltage of the second transistor is applied to the current path.

22. The circuit according to claim 21 wherein the current limiting circuit further comprises a resistance disposed in the current path.

23. The circuit according to claim 22 wherein the voltage arising from the base-emitter voltage of the second transistor is applied to a node between the resistance and the first transistor.

24. The circuit according to claim 23 wherein the voltage arising from the base-emitter voltage of the second transistor is applied to a node between the resistance and collector and emitter terminals of the first transistor.

25. The circuit according to claim 24 wherein the resistance comprises:
a first resistance; and
a second resistance coupled in series with the first resistance.

26. The circuit according to claim 25 further comprising a switch for selectively bypassing the first resistance so that only the second resistance is disposed in the current path.

27. The circuit according to claim 26 wherein the switch comprises a transistor coupled to a node between the first resistance and the second resistance.

28. The circuit according to claim 24 wherein the resistance comprises:

a first resistance; and

a second resistance coupled in parallel with the first resistance.

29. The circuit according to claim 28 further comprising a switch for selectively bypassing the first resistance so that only the second resistance is disposed in the current path.

30. The circuit according to claim 29 wherein the switch comprises a transistor coupled to a node between the first resistance and the second resistance.

31. The circuit according to claim 24 wherein the second transistor has a base terminal coupled to the current path and a collector terminal coupled to a base terminal of the first bipolar transistor.